

WHAT IS A BIOCHIP?

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Анотація

Біочіп - це організоване розміщення молекул ДНК або білка на спеціальному носії - «платформі», його можливості значно перевищують сьгоднішні електронні засоби в більшості аспектів. Головним завданням даної доповіді є ознайомлення аудиторії з багатофункціональністю біочіпа, показати його переваги та недоліки.

Ключові слова: біочіп, аналіз, експеримент, використання.

Abstract

Biochip - is organized by placing molecules of DNA or protein at a special media - "platform .", Its capabilities far exceed today's electronic media in most aspects. The main objective of this report is to familiarize the audience with the multifunctionality biochip show its advantages and disadvantages

Keywords: biochip, analysis, experiment, using.

A biochip is a collection of miniaturized test sites (microarrays) arranged on a solid substrate that permits many tests to be performed at the same time in order to achieve higher throughput and speed. Typically, a biochip's surface area is no larger than a fingernail. Like a computer chip that can perform millions of mathematical operations in one second, a biochip can perform thousands of biological reactions, such as decoding genes, in a few seconds. Biochip is a broad term indicating the use of microchip technology in molecular biology and can be defined as arrays of selected biomolecules immobilized on a surface. Biochip will also be used in animal and plant breeding, and in the monitoring of foods and the environment. Biochip is a small-scale device, analogous to an integrated circuit, constructed of or used to analyze organic molecules associated with living organisms. One type of theoretical biochip is a small device constructed of large organic molecules, such as proteins, and capable of performing the functions (data storage, processing) of an electronic computer. The other type of biochip is a small device capable of performing rapid, small-scale biochemical reactions for the purpose of identifying gene sequences, environmental pollutants, airborne toxins, or other biochemical constituents.

Like a computer chip that can perform millions of mathematical operations in one second, a biochip can perform thousands of biological reactions, such as decoding genes, in a few seconds. Biochips helped to dramatically accelerate the identification of the estimated 80,000 genes in human DNA, an ongoing world-wide research collaboration known as the Human genome project. Developing a biochip platform incorporates electronics for addressing, reading out, sensing and controlling temperature and, in addition, a handheld analyzer capable of multiparameter identification. The biochip platform can be plugged in a peripheric standard bus of the analyzer device or communicate through a wireless channel. Biochip technology has emerged from the fusion of biotechnology and micro/nanofabrication technology. Biochips enable us to realize revolutionary new bioanalysis systems that can directly manipulate and analyze the micro/nano-scale world of biomolecules, organelles and cells.

The "chip contains a 10 character alphanumeric identification code that is never duplicated. When a scanner is passed over the chip, the scanner emits a 'beep' and your ... number flashes in the scanner's digital display." Biochips concentrate thousands of different genetic tests on a surface area of just a few square centimetres so that they can be analysed by computer within a very short space of time. On the one hand this makes the individual genetic tests much cheaper and on the other hand, thanks to the capacity, many more tests can be carried out.

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the name of GeneChip . In this context, microarray means that the genetic tests are organised (arrayed) in micrometre spacing(micro).As it was not previously possible to go below the millimetre range, the description “high density” is certainly justified. Experiments (e.g. measurement of gene activity or sequencing to demonstrate mutations and polymorphisms) that could previously only be done individually, one after the other, can now be carried out in large numbers at the same time and in a highly automated manner.

Biochips are fast, accurate, miniaturized, and can be expected to become economically advantageous attributes that make them analogous to a computer chip. One expects to see an accelerated trend of ultraminiaturization, perhaps involving entirely novel media, and an increased ability to analyze not only genetic material but also other types of biologic molecules. One expects, too, an eventual harmonization of technologies, so that dominant fabrication strategies will emerge, at least for certain types of applications, including a favored format for genetic analysis and another for antibodies and other proteins. Since the potential applications are vast, both for research and for clinical use, the potential markets for biochips will be huge, a powerful driving force for their continued development .

REFERENCES

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